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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/787,148 | 02/27/2004 | Choong-Bin Lim | 9862-000019/US | 4630 |
| 30593 | 7590 | 09/29/2006 | EXAMINER | |
| HARNESS, DICKEY & PIERCE, P.L.C. | | | SUN, SCOTT C | |
| P.O. BOX 8910 | | | ART UNIT | |
| RESTON, VA 20195 | | | PAPER NUMBER | |
| | | | 2182 | |

DATE MAILED: 09/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/787,148

Applicant(s)

LIM ET AL.

Examiner

Scott Sun

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-9 and 11-16 is/are rejected.
- 7) ☒ Claim(s) 6 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-8 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 1 recites "a second plurality of buffers" without reciting a first plurality of buffers. It is unclear if there are two sets of buffers, or applicant is merely referring to the set of buffers being a set separate from the endpoints. In case of the latter, it is suggested that the claim simply recite "a plurality of endpoints" and "a plurality of buffers" to avoid the ambiguity as stated above. The claims will be interpreted as such for the purpose of continuing prosecution.
4. Claims 2-8 are rejected because of their dependency on claim 1.
5. The following rejections are made based on the examiner's best interpretation of the claims in light of the 35 USC 112 rejections above.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-5, 7-9, 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art in view of Terry et al (PG Pub #2004/0027997).

8. Regarding claim 1, applicant's admitted prior art discloses a device (shown in prior art figures 3 and 6) for controlling a first plurality of endpoints (endpoints; figure 3) of a USB device, the device comprising: a plurality of buffers (buffers; figure 3) allocated to the first plurality of endpoints, respectively (background; paragraph 11); and an endpoint buffer controller (MCU 626; figure 6) for managing an exchange of packets between a host and the USB device (paragraphs 23-24).

Applicant's admitted prior art does not disclose explicitly obtaining buffer-utilization information or adaptively adjusting the buffers. However, Terry discloses obtaining buffer-utilization information (status of the buffer, quality indicator) for each of endpoints (data flows to which buffers are assigned) and adaptively adjusting the buffers for the endpoints based upon the buffer utilization information (paragraphs 24-26). Teachings of applicant's admitted prior art and Terry are from the same field of data buffering.

Therefore, it would have been obvious at the time of invention to combine teachings of applicant's admitted prior art with teachings of Terry by adding the buffer adjustment logic into the buffer system of applicant's admitted prior art for the benefit of increasing performance of the transmission system (paragraph 15).

9. Regarding claim 2, applicant's admitted prior art and Terry combined disclose claim 1, and applicant's admitted prior art further discloses wherein each for the plurality

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of buffers has a plurality of units and a maximum size (maximum packet size) of $\text{unit_size} \times Z$, where Z is a positive integer representing the total number of units per buffer, respectively (paragraph 25). Examiner notes that computer memory by definition is organized into a plurality of fixed size units (typically bytes).

10. Regarding claim 3-5, 7, applicant's admitted prior art and Terry combined disclose claim 1, and Terry further discloses counting NAK in a certain time period as a quality indicator to determine quality of channel and corresponding buffer sizes (paragraph 31). Applicant's admitted prior art and Terry does not disclose explicitly the specific hardware, as claimed by applicant, for implementing the method. However, such hardware would have been obvious design choices for a person of ordinary skill in the art in light of the teachings of Terry and applicant's admitted prior art. For example, a timer would be needed to track the time period taught by Terry, a counter would be needed to keep the count of NAK signals taught by Terry.

11. Regarding claim 8, applicant's admitted prior art and Terry combined disclose claim 1 and Terry further discloses wherein the buffers are first-in, first-out (FIFO) buffers (paragraph 12).

12. Regarding claims 9, 12-16, examiner notes that these claims contain limitations that are substantially similar to the above rejected claims, the same grounds of rejection are applied. Note for claim 13 that applicant's admitted prior art disclose using SIE (serial interface engine; figure 2, paragraph 8) as interface to a USB host.

Allowable Subject Matter

13. Claims 6 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter.

Claims 6 and 10 recite, inter alia, wherein a period T is obtained by doing of taking the inverse of a frequency determined by counting start of frame signals from the host during an interval and adopting a frame period of a full-speed mode of a USB protocol. Prior art of record do not teach or suggest, either alone or in combination, the aforementioned limitation, nor would it be obvious to modify those references to include such limitation. Examiner notes that Terry's method of counting NAK signals does not teach that the buffer allocation system uses USB protocol, and therefore it would not have been obvious to derive the specific period, as in claims 6 and 10, during which to count NAK signals.

Conclusion

15. Other publications are cited to further show the state of the art with respect to buffer allocation. Refer to form 892, "Notice of References Cited", for a complete list of relevant prior arts cited by the examiner.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Sun whose telephone number is (571) 272-2675. The examiner can normally be reached on M-F, 10:30am-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim N. Huynh can be reached on (571) 272-4147. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SS



KIM HUYNH
SUPERVISORY PATENT EXAMINER

09/27/04